NEW COMBINATIONS IN THE GENUS *CYMOPTERUS* (APIACEAE) OF THE SOUTHWESTERN UNITED STATES

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ABSTRACT

Preparation of the Apiaceae for Bolack San Juan Basin Flora has necessitated the following new combinations: *Cymopterus breviradiatus, C. davidsonii, C. glomeratus* var. *fendleri*, and *C. sessiliflorus*.

RESUMEN

La preparación de las Apiaceae para la Flora de Bolack San Juan Basin ha necesitado las siguientes combinaciones nuevas: *Cymopterus breviradiatus, C. davidsonii, C. glomeratus* var. *fendleri*, y *C. sessiliflorus*.

In revising *Cymopterus* Raf. (Apiaceae) of the greater Four Corner's region for the San Juan Flora (Heil et al.), it has become necessary to make the following nomenclatural innovations. The aforementioned treatment represents a continued reliance on characters of the fruit and of vegetative morphology (Mathias & Constance 1944–45; Cronquist et al. 1997). Recently, several phylogenetic analyses of nuclear (ITS) and plastid (*rps*16 intron) sequences (Downie et al. 2002; Sun & Downie 2004; Sun et al. 2004) have defined a group, likely monophyletic, of western North American apioids. Genera include *Aletes* J.M. Coult. & Rose, *Cymopterus* [here circumscribed to include *Oreoxis* Raf., *Pseudocymopterus* J.M. Coult. & Rose, and *Pteryxia* (Nutt. ex Torr. & A. Gray) J.M. Coult. & Rose], *Harbouria* J.M. Coult. & Rose, *Lomatium* Raf., *Musineon* Raf., *Neoparrya* Mathias, *Oreogenia* S. Wats., *Oreonana* Jeps., *Podistera* S. Wats., and *Shoshonea* Evert & Constance. Thus far the molecular trees are poorly resolved with the basal branches containing several to many polytomies, thus obscuring relationships among terminal groups. A number of terminal clusters make sense to one steeped in western umbels while others seemingly defy logic. It is hoped that additional sequence data will provide sufficient insight into the evolution of the western apioides so that a stable classification can be established.

Cymopterus breviradiatus (W.L. Theob. & C.C. Tseng) R.L. Hartm., comb. & stat. nov.
BASIONYM: *Aletes macdougalii* J.M. Coult. & Rose subsp. *breviradiatus* W.L. Theob. & C.C. Tseng, Brittonia 16:306, fig. 6. 1964.

The genus *Aletes* is defined by its laterally flattened (versus terete to dorsally flattened) fruit. This lateral compression is prominent in the type species, *A. acaulis* (Torr.) J.M. Coult. & Rose and its presumed closest relatively, *A. humilis* J.M. Coult. & Rose. None of the three taxa of *Aletes* for which nomenclatural innovations are here made have fruit that are flattened laterally. Although molecular studies may eventually show that this is a fickle character, it is one that has been relied upon traditionally.

Based on gestalt and technical features of the fruits and leaves, *Cymopterus breviradiatus* is extremely similar to *Cymopterus sessiliflorus* (Theobald et al. 1964) despite the fact

that the two taxa do not group near one another based on molecular data (Fig. 2, Sun & Downie 2004). There is ample justification for removing subsp. *breviradiatus* from subjugation to *Cymopterus macdougalii* (J.M. Coult. & Rose) Tidestrom [*Oreoxis m.* J.M. Coult. & Rose, 1913; *Aletes m.* J.M. Coult. & Rose, 1935]. The former has fruit with corky-thickened wings whereas *C. macdougalii* has weakly developed, thin wings. *Cymopterus beckii* S.L. Welsh & Goodrich appears virtually identical to *C. macdougalii* morphologically. This is reinforced thanks to the number of collections of each that have been amassed in recent years. Consequently the former is treated as a synonym of *C. macdougalii*. Furthermore, as sequence data indicate (Figure 2, Sun & Downie 2004), *C. macdougalii*, *C. (Pteryxia) davidsonii*, and *C. beckii* group with *C. lemmonii* (Coult. & Rose) R.D. Dorn [*Pseudocymopterus montanus* J.M. Coult. & Rose]. *C. davidsonii* strongly resembles *C. macdougalii* morphologically and they may represent sister taxa.

Cymopterus davidsonii (J.M. Coult. & Rose) R.L. Hartm., comb. nov. BASIONYM: *Aletes? davidsonii* J.M. Coult. & Rose, Contr. U.S. Natl. Herb. 7:107. 1900. *Pseudocymopterus davidsonii* (J.M. Coult. & Rose) Mathias, Ann. Missouri Bot. Gard. 17:282, 316. 1930. *Pteryxia davidsonii* (J.M. Coult. & Rose) Mathias & Constance, Bull. Torrey Bot. Club 69:248. 1942.

This species was most recently treated in *Pteryxia* (Mathias & Constance 1944-45) and tentatively attributed to *Pseudocymopterus* (Cronquist et al. 1997).

The reader is referred to comments provided under *Cymopterus breviradiatus*.

Cymopterus glomeratus (Nutt.) DC. var. **fendleri** (A. Gray) R.L. Hartm., comb. & stat. nov. BASIONYM: *Cymopterus fendleri* A. Gray, Mem. Amer. Acad., n.s. 2. 4:56. 1849.

Specific epithet: *Cymopterus glomeratus* (Nutt.) DC., Prodr. 4:204. 1830. BASIONYM: *Thapsia glomerata* Nutt., Gen. N. Amer. Pl. 1:184. 1818, for which *Cymopterus acaulis* Raf., Herb. Raf. 2:40. 1833, is illegimate and surperfluous (nom. nov. for *Selinum acaule* Pursh, Fl. Amer. Sept. 2: 732, 1813, non Cav., 1799; International Plant Names Index 2005).

Cymopterus fendleri long has been treated as distinct from the related *C. glomeratus* (*C. acaulis*; Mathias & Constance 1944–45) or as a variety of it (Cronquist 1997 et al.; Goodrich 2003). A recent study (Sun et al. 2005) using principal component analyses failed to discriminate among the five varieties recognized by Goodrich (2003). Despite this lack of resolution, the above combination is made for botanists, including myself, wishing to recognize var. *fendleri*.

Cymopterus sessiliflorus (W.L. Theob. & C.C. Tseng) R.L. Hartm., comb. nov. BASIONYM: *Aletes sessiliflorus* W.L. Theob. & C.C. Tseng, Brittonia 16:309. 1964.

The reader is referred to comments provided under *Cymopterus breviradiatus*.

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REFERENCES

CRONQUIST, A., N.H. HOLMGREN, and P.K. HOLMGREN. 1997. Intermountain flora: Vascular plants of the Intermountain West, U.S.A. Vol. 3A: Subclass Rosidae (except Fabales). New York Bot. Garden, Bronx. P. 372.

DOWNIE, S.R., R.L. HARTMAN, F.-J. SUN, and D.S. KATZ-DOWNIE. 2002. Polyphyly of the spring-parsleys (*Cymopterus*): molecular and morphological evidence suggests complex relationships among the perennial endemic genera of western North American Apiaceae. Canad. J. Bot. 80:1295–1324.

GOODRICH, S. 2003. In: S.L. Welsh, N.D. Atwood, S. Goodrich, and L.C. Higgins, eds. A Utah flora, ed. 3. Brigham Young Univ., Provo, Utah. P. 654.

HEIL, K. et al. Bolack San Juan Basin flora. Missouri Botanical Garden Press, St. Louis, Missouri. In prep.

INTERNATIONAL PLANT NAME INDEX, THE. 2005. (http://www.ipni.org).

MATHIAS, M.E. and L. CONSTANCE. 1944-45. Umbelliferae. N. Amer. Fl. 28B: 187. New York Bot. Garden, Bronx.

SUN F.-J. and S.R. DOWNIE. 2004. A molecular systematic investigation of *Cymopterus* and its allies (Apiaceae) based on phylogenetic analyses of nuclear (ITS) and plastid (rps16 intron) DNA sequences. S. African J. Bot. 70:407–416.

SUN F.-J., S. R. DOWNIE, and R.L. HARTMAN. 2004. An ITS-based phylogenetic analysis of the perennial, endemic Apiaceae subfamily Apioideae of western North America. Syst. Bot. 29:419–431.

SUN F.-J., G.A. LEVIN, and S.R. DOWNIE. 2005. A multivariate analysis of *Cymopterus glomeratus*, formerly known as *C. acaulis* (Apiaceae). Rhodora 107:359–385.

THEOBALD, W.L., C.C. TSENG, and M.E. MATHIAS. 1964. A revision of *Aletes* and *Neoparrya* (Umbelliferae). Brittonia 16:296–315.